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EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1723

MAIL DATE

DELIVERY MODE

10/12/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,947

Applicant(s)

BUREAU ET AL.

Examiner

WILLIAM T. LEADER

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2010.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) 5, 12 and 13 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date 3/30/2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election of Group I and species A in the reply filed on July 14, 2010, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6-8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hodes et al (US 3,554,882).

4. The Hodes et al patent (hereinafter Hodes) discloses the deposition of a thick and adherent polymer coating on a metallic surface from a solution containing a solvent in which a monomer, acid and electrochemical initiator are soluble. See the abstract and column 1, lines 40-46. One solution disclosed by Hodes at column 2, lines 20-35 included 10 ml water, 10 wt% acrylamide, 1 wt% N-N' methylenebisacrylamide and 2 wt % N-N' ethylene bisacrylamide, and 0.5ml concentrated HCl. Concentrated HCl contains 38% hydrogen chloride (Condensed Chemical Dictionary, pp 486-487). The HCl functions as a Bronsted acid. An amount of 0.5 ml of 38 % hydrogen chloride in 10 ml of water corresponds to approximately 19,000 ppm. This amount falls within the range recited in step a) of claim 1. Into this solution, two steel electrodes

were placed. A voltage of 22.5V was applied and a polymer was formed on the cathode. This corresponds to step b) of applicant's claim 1. All limitation recited in instant claim 1 are disclosed by Hodes.

5. With respect to claim 2, as noted above, the solution of Hodes contained hydrogen chloride.

6. With respect to claims 3 and 4, Hodes discloses the inclusion of acrylamide as a monomer in the solution. Acrylamide is one of the vinyl monomers recited in instant claim 4.

7. With respect to claim 6, acrylamide ($\text{CH}_2\text{CHCONH}_2$) has a molecular weight of 71, so approximating 1 liter of the solution of Hodes as 1000g, 10 wt% of acrylamide is 100 grams or 1.4 moles. This amount falls within the range recited in claim 6.

8. With respect to claim 7, Hodes discloses that the invention is not limited to only aqueous formulations. The solvent could be a polar organic compound such as dimethylformamide. See column 3, lines 18-25.

9. With respect to claim 8, the solution of Hodes additionally contains an electrochemical initiator such as hydrogen peroxide or a persulfate.

10. With respect to claim 10, as noted above, the electrically conducting surface used by Hodes was steel.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodes et al (US 3,554,882).

14. Hodes is interpreted as above. In the solution described at column 2, lines 23-35, 0.5ml concentrated HCl was added to 10ml of water. Concentration is recognized as a result effective variable. Choice of various concentrations of HCl would have been a matter of routine optimization within the skill of the ordinary worker in the art. See MPEP 2144.50 II.

15. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hodes et al (US 3,554,882) as applied to claims 1-4, 6-8 and 10 above, and further in view of Jerome et al (US 6,375,821).

16. Claim 11 recites the use of potentiostatic or galvanostatic voltammetric conditions. As noted above, Hodes discloses the application of a voltage, but does not specify that the voltage is potentiostatic or the resulting current is galvanostatic. The Jerome et al patent is directed to a process for depositing a polymer by electrografting. See the abstract. To provide refined control

of the electrolysis conditions Jerome discloses the use of either potentiostatic electrolysis or galvanostatic electrolysis. See column 3, lines 13-27. It would have been obvious to have utilized potentiostatic or galvanostatic conditions in the process of Hodes as taught by Jerome because refined control of the process would have been obtained.

17. Claims 1, 2 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naarmann (US 4,547,270).

18. The Naarmann patent is directed to the electrochemical polymerization of pyrroles with deposition of the pyrrole polymer at a sheet-like anode which includes a non-conductive sheet-like element and an electrically conducting support. . See the abstract. The process is carried out in an electrolyte solvent in which the monomers are dissolved or dispersed. Suitable solvents include polar organic solvents. If a water-miscible organic solvent is used, it is also possible to add water in an amount not greater than 10% by weight based on the electrolyte solvent in order to increase the electrical conductivity. See column 4, lines 50-52. Water functions as a Bronsted acid. A water content of 10 wt% corresponds to 100,000 ppm. Thus, Naarmann teaches the inclusion 100,000 ppm water or less. This range overlaps the range of 50-100,000 ppm recited in step a) in applicant's claim 1.

19. Naarmann teaches that any direct current source can be used as a current source. Usually the electrochemical polymerization is carried out using a voltage of from 0.1 to 100 volts. The current density may be 0.05 to 20 mA/cm². See column 6, lines 13-21. Polymer formation takes place over the entire area of the anode. See column 2, lines 46-65. Application of a current to cause polymerization in the process of Naarmann corresponds to step b) of instant claim 1.

20. The process of Naarmann may also be carried out using an electrolyte solvent that contains a conductive salt which serves to transport current in the solvent during electrical polymerization. The conductive salt may contain H^+ or alkali metal cations. When the cation is H^+ , the compound would function as an acid. Salts of aliphatic or aromatic carboxylic acids such as acetic acid or benzoic acid may be used. The salt may be present in amount of 0.001 to 1 mole per liter of electrolyte solvent. Acetic acid has a molecular weight of 60, so 0.001 mole per liter equals .06 grams per liter and corresponds to approximately 60 ppm. A concentration of 1 mole acetic acid per liter equals 60 grams per liter and corresponds to approximately 60,000 ppm. These values fall within the range recited in step a) of claim 1.

21. Applicant's process as recited in claim 1 differs from the process of Naarmann by reciting a different range for the concentration of compounds which function as Bronsted acids. Nevertheless, the range recited by applicant overlaps the ranges disclosed by Naarmann. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious to have chosen a value for the concentrations of water or of a conductive salt from within the ranges recited by Naarmann. See MPEP 2144.05 I.

22. With respect to claim 2, as noted above, Naarmann discloses inclusion of water or molecules carrying carboxylic acid groups.

23. With respect to claim 6, the concentration of pyrroles or the mixtures of pyrroles with co-monomers is generally from 0.001 to 5 moles per liter of electrolyte solvent, but may be above or below these limits. This range overlaps the range recite in claim 3. Choice of a value from within the range disclosed by Naarmann would have been obvious. See MPEP 2144.05 I.

24. With respect to claim 7, Naarmann discloses that the solvent may be acetonitrile or dimethylformamide. See column 4, lines 50-58.

25. With respect to claim 8, as noted above, Naarmann discloses the inclusion of a conductive salt.

26. With respect to claim 9, the recited range overlaps the ranges disclosed by Naarmann. Choice of a value from within the range disclosed by Naarmann would have been obvious. See MPEP 2144.05 I.

27. With respect to claim 10, Naarmann disclosed the use of platinum as an electrically conducting material. See example 1.

28. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naarmann (US 4,547,270) as applied to claims 1, 2 and 6-10 above, and further in view of Jerome et al (US 6,375,821).

29. Claim 11 recites the use of potentiostatic or galvanostatic voltammetric conditions. As noted above, Naarmann discloses the application of a voltage which results in a current density, but does not specify that the voltage is potentiostatic or the current is galvanostatic. The Jerome et al patent is directed to a process for depositing a polymer by electrografting. See the abstract. To provide refined control of the electrolysis conditions Jerome discloses the use of either potentiostatic electrolysis or galvanostatic electrolysis. See column 3, lines 13-27. It would have been obvious to have utilized potentiostatic or galvanostatic conditions in the process of Naarmann as taught by Jerome because refined control of the process would have been obtained.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/
September 23, 2010

/Patrick Joseph Ryan/
Supervisory Patent Examiner, Art Unit 1795